

REMARKS/ARGUMENTS

This Amendment addresses issues raised in the Official Action of August 22, 2007 and discussed during an interview between the undersigned and Examiner Sergeant on September 18, 2007 as correctly summarized in the Interview Summary mailed September 24, 2007. This statement is made pursuant to MPEP §713.04.

The independent claims have been amended in order to exclude blocked isocyanates. This Amendment plus the polyisocyanate or isocyanate prepolymer must be selected from a defined group of four components that make it clear that blocked isocyanates are excluded from the claimed methods.

As noted in the last sentence of the continuation sheet of the Interview Summary, the examiner requests that a more indepth discussion of the data contained in the Evidentiary Declaration of Mr. Kometani, the senior inventor, be provided in order to assist in understanding the data and appreciating the results obtained are indeed unexpected. Submitted herewith is a detailed explanation of the data of record in this application and in particular presented in the Kometani declaration made June 6, 2006. The discussion is referenced to the first Table on page 2 of the Declaration followed by a discussion of each of the seven formulations A-G outlined in the Table and given in more detail in the Declaration. With the evidence of record together with the attached Declaration it will be apparent that applicants' claims are directed to subject matter that is in no way suggested by the combination of Haigo et al ('104) in view of Laas et al ('044) and Nakamura et al ('034) and Hannah et al ('659).

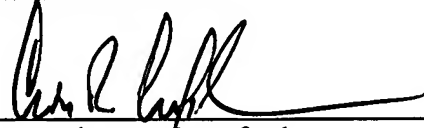
Favorable consideration is requested.

KOMETANI et al
Appl. No. 10/724,608
October 30, 2007

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____



Arthur R. Crawford
Reg. No. 25,327

ARC:eaw
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

補足説明

| | Polyether polyol | Polyester polyol | Polymer polyol | Flame retardant polyol |
|---------------------|------------------|------------------|----------------|------------------------|
| MDI | Formulation B | | | |
| TDI | Formulation C | | | |
| MDI base prepolymer | Formulation A | Formulation E | Formulation F | Formulation G |
| TDI base prepolymer | Formulation D | | | |

| Formulation: | | |
|--------------|---------------------|------------------------|
| A | MDI base prepolymer | Polyether polyol |
| B | MDI | Polyether polyol |
| C | TDI | Polyether polyol |
| D | TDI base prepolymer | Polyether polyol |
| E | MDI base prepolymer | Polyester polyol |
| F | MDI base prepolymer | Polymer polyol |
| G | MDI base prepolymer | Flame retardant polyol |

1. Formulation A (Table 3 to 5 in the application)

As is evident from Example 7 to 12 and FIGS. 1 to 6, when the catalyst of the present invention is employed, it is possible to satisfy both the desired long pot life and the rapid viscosity increase.

As is evident from Comparative Example 1 and FIG. 7, even when the acid of the present invention is used, if the ratio of the amine/the acid exceeds 1.3 by molar ratio, the rapid increase of the viscosity tends to be lost.

As is evident from Comparative Example 2 and FIG. 8, and from Comparative Example 6 and FIG. 12, when a catalyst having DBU blocked with formic acid or phenol, is used, it tends to be difficult to obtain a long pot life, although the rapid viscosity increase can be attained. Further, as is evident from Comparative Example 3 and FIG. 9, when 2-ethylhexanoic acid is used as the acid, the viscosity increase is not rapid, such being not practical. Namely, with an aliphatic monocarboxylic acid having no unsaturated bond in its molecule, it is impossible to satisfy both the long pot life and the rapid viscosity increase.

As is evident from Comparative Example 4 and FIG. 10, when p-toluenesulfonic acid is used as the acid, the viscosity increase hardly takes place even when a large amount of the catalyst is used, whereby no rapid increase of the viscosity is observed. Further, as is evident from Comparative Example 5 and FIG. 11, also in a case where a dicarboxylic acid is used instead of a monocarboxylic acid, the viscosity increase is slow and is not practical, even if the acid has an unsaturated bond.

As is evident from Comparative Example 8 and FIG. 14, when a lead catalyst is employed as a substitute for a mercury catalyst, the catalytic activity is very strong, but the viscosity increase is not rapid, whereby it is difficult to obtain the required pot life and the rapid viscosity increase.

As is evident from the foregoing results, by using the catalyst of the present invention, it is possible to satisfy both the long pot life and the rapid viscosity increase, in the same manner as is the mercury catalyst which is used to be employed. Further, it should be readily understood that even if the bicyclic amidine catalyst (DBU, DBN or DBD) is blocked with an acid other than the acid of the present invention, the long pot life can not be obtained, or the rapid viscosity increase can not be attained.

2. Formulation B (Table 4, 6, 7 in the declaration dated Jun 07, 2006)

As is evident from Example 13 to 16, when the catalyst of the present invention is employed, it is possible to satisfy both the desired long pot life and the rapid viscosity increase.

As is evident from Comparative Example 9, when a catalyst having DBU blocked with formic acid is used, it tends to be difficult to obtain a long pot life, although the rapid viscosity increase can be attained. Further, as is evident from Comparative Example 10, when 2-ethylhexanoic acid is used as the acid, the viscosity increase is not rapid, such being not practical. Namely, with an aliphatic monocarboxylic acid having no unsaturated bond in its molecule, it is impossible to satisfy both the long pot life and the rapid viscosity increase.

As is evident from Comparative Example 11, when p-toluenesulfonic acid is used as the acid, the viscosity

increase hardly takes place even when a large amount of the catalyst is used, whereby no rapid increase of the viscosity is observed.

As is evident from Comparative Example 13, when a lead catalyst is employed as a substitute for a mercury catalyst, the catalytic activity is very strong, but the viscosity increase is not rapid, whereby it is difficult to obtain the required pot life and the rapid viscosity increase.

3. Formulation C (Table 8 to 10 in the declaration dated Jun 07, 2006)

As is evident from Example 13 to 16, when the catalyst of the present invention is employed, it is possible to satisfy both the desired long pot life and the rapid viscosity increase.

As is evident from Comparative Example 9, when a catalyst having DBU blocked with formic acid is used, it tends to be difficult to obtain a long pot life, although the rapid viscosity increase can be attained. Further, as is evident from Comparative Example 10, when 2-ethylhexanoic acid is used as the acid, the viscosity increase is not rapid, such being not practical. Namely, with an aliphatic monocarboxylic acid having no unsaturated bond in its molecule, it is impossible to satisfy both the long pot life and the rapid viscosity increase.

As is evident from Comparative Example 11, when p-toluenesulfonic acid is used as the acid, the viscosity increase hardly takes place even when a large amount of the catalyst is used, whereby no rapid increase of the viscosity is observed.

As is evident from Comparative Example 13, when a lead catalyst is employed as a substitute for a mercury catalyst, the catalytic activity is very strong, but the viscosity increase is not rapid, whereby it is difficult to obtain the required pot life and the rapid viscosity increase.

4. Formulation D (Table 11 to 13 in the declaration dated Jun 07, 2006)

As is evident from Example 17 to 20, when the catalyst of the present invention is employed, it is possible to satisfy both the desired long pot life and the rapid viscosity increase.

As is evident from Comparative Example 14, when a catalyst having DBU blocked with formic acid is used, it tends to be difficult to obtain a long pot life, although the rapid viscosity increase can be attained. Further, as is evident from Comparative Example 15, when 2-ethylhexanoic acid is used as the acid, the viscosity increase is not rapid, such being not practical. Namely, with an aliphatic monocarboxylic acid having no unsaturated bond in its molecule, it is impossible to satisfy both the long pot life and the rapid viscosity increase.

As is evident from Comparative Example 16, when p-toluenesulfonic acid is used as the acid, the viscosity increase hardly takes place even when a large amount of the catalyst is used, whereby no rapid increase of the viscosity is observed.

As is evident from Comparative Example 18, when a lead catalyst is employed as a substitute for a mercury catalyst, the catalytic activity is very strong, but the viscosity increase is not rapid, whereby it is difficult to obtain the required pot life and the rapid viscosity increase.

5. Formulation B (Table 14 to 16 in the declaration dated Jun 07, 2006)

As is evident from Example 21 to 24, when the catalyst of the present invention is employed, it is possible to satisfy both the desired long pot life and the rapid viscosity increase.

As is evident from Comparative Example 19, when a catalyst having DBU blocked with formic acid is used, it tends to be difficult to obtain a long pot life, although the rapid viscosity increase can be attained. Further, as is evident from Comparative Example 20, when 2-ethylhexanoic acid is used as the acid, the viscosity increase is not rapid, such being not practical. Namely, with an aliphatic monocarboxylic acid having no unsaturated bond in its molecule, it is impossible to satisfy both the long pot life and the rapid viscosity increase.

As is evident from Comparative Example 21, when p-toluenesulfonic acid is used as the acid, the viscosity increase hardly takes place even when a large amount of the catalyst is used, whereby no rapid increase of the viscosity is observed.

As is evident from Comparative Example 23, when a lead catalyst is employed as a substitute for a mercury catalyst, the catalytic activity is very strong, but the viscosity increase is not rapid, whereby it is difficult to obtain the required pot life and the rapid viscosity increase.

6. Formulation P (Table 17 to 19 in the declaration dated Jun 07, 2006)

As is evident from Example 25 to 28, when the catalyst of the present invention is employed, it is possible to satisfy both the desired long pot life and the rapid viscosity increase.

As is evident from Comparative Example 24, when a catalyst having DBU blocked with formic acid is used, it tends to be difficult to obtain a long pot life, although the rapid viscosity increase can be attained. Further, as is evident from Comparative Example 25, when 2-ethylhexanoic acid is used as the acid, the viscosity increase is not rapid, such being not practical. Namely, with an aliphatic monocarboxylic acid having no unsaturated bond in its molecule, it is impossible to satisfy both the long pot life and the rapid viscosity increase.

As is evident from Comparative Example 26, when p-toluenesulfonic acid is used as the acid, the viscosity increase hardly takes place even when a large amount of the catalyst is used, whereby no rapid increase of the viscosity is observed.

As is evident from Comparative Example 28, when a lead catalyst is employed as a substitute for a mercury catalyst, the catalytic activity is very strong, but the viscosity increase is not rapid, whereby it is difficult to obtain the required pot life and the rapid viscosity increase.

7. Formulation G (Table 20 to 22 in the declaration dated Jun 07, 2006)

As is evident from Example 29 to 32, when the catalyst of the present invention is employed, it is possible to satisfy both the desired long pot life and the rapid viscosity increase.

As is evident from Comparative Example 29, when a catalyst having DBU blocked with formic acid is used, it tends to be difficult to obtain a long pot life, although the

rapid viscosity increase can be attained. Further, as is evident from Comparative Example 30, when 2-ethylhexanoic acid is used as the acid, the viscosity increase is not rapid, such being not practical. Namely, with an aliphatic monocarboxylic acid having no unsaturated bond in its molecule, it is impossible to satisfy both the long pot life and the rapid viscosity increase.

As is evident from Comparative Example 31, when p-toluenesulfonic acid is used as the acid, the viscosity increase hardly takes place even when a large amount of the catalyst is used, whereby no rapid increase of the viscosity is observed.

As is evident from Comparative Example 33, when a lead catalyst is employed as a substitute for a mercury catalyst, the catalytic activity is very strong, but the viscosity increase is not rapid, whereby it is difficult to obtain the required pot life and the rapid viscosity increase.

As is evident from the foregoing results, by reacting a polyol with an organic polyisocyanate and/or an isocyanate prepolymer selected from the group consisting of MDI, TDI, MDI prepolymer and MDI prepolymer in the presence of the catalyst of the present invention, it is possible to satisfy both the long pot life and the rapid viscosity increase, in the same manner as is the mercury catalyst which used to be employed. Further, it should be readily understood that even if the bicyclic amidine catalyst is blocked with an acid other than the acid of the present invention, the long pot life can not be obtained, or the rapid viscosity increase can not be attained.